COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

DIAMOND DRILLING

Telfer and Burgess Groups

Fort Steele Mining Division

Mark Creek Area

N.T.S. 82F/9

- Assessment Report -

LATITUDE: 49° 44.5′ N

LONGITUDE: 116° 03′ W

OWNER

Cominco Ltd.

Box 2000
Kimberley, B.C.
V1A 2G3

Work performed during October to December, 1987
and January to February , 1988

Report by:

P.W. Ransom
Project Geologist

ARIS SUMMARY SHEET

District Geologist, Nelson — Off Confidential: 89.03.04

ASSESSMENT REPORT 17141 — MINING DIVISION: Fort Steele

PROPERTY: Sullivan
LOCATION: LAT 49 44 30 LONG 116 03 25
UTM 11 5510116 567949
NTS 082F09E
CLAIM(S): Telfer,Burgess,Doug,Panta
OPERATOR(S): Cominco
AUTHOR(S): Ransom, P.W.
REPORT YEAR: 1988, 25 Pages
COMMODITIES
SEARCHED FOR: Lead,Zinc,Silver,Tin
GEOLOGICAL
SUMMARY: The drill hole reported on herein intersected sediments of the Middle Proterozoic Middle Aldridge Formation. No sulphide mineralization of interest was intersected.
WORK
DONE: Drilling,Physical
DIAD 1738.0 m 1 hole(s);HQ ,NQ
ROAD 1.8 km

TABLE OF CONTENTS

COMINCO LTD.

EXPLORATION
NTS 82F/9

WESTERN DISTRICT

DIAMOND DRILLING REPORT

ASSESSMENT REPORT

TELFER AND BURGESS GROUPS

Fort Steele Mining Division

February, 1988

P.W. Ransom

1.00 INTRODUCTION

1.10 Specific Location

DDH 6464, the hole being reported on, was drilled 4 kilometers northwest of Sullivan Mine. Access to the drill site is by exploration access roads.

1.20 Property Description

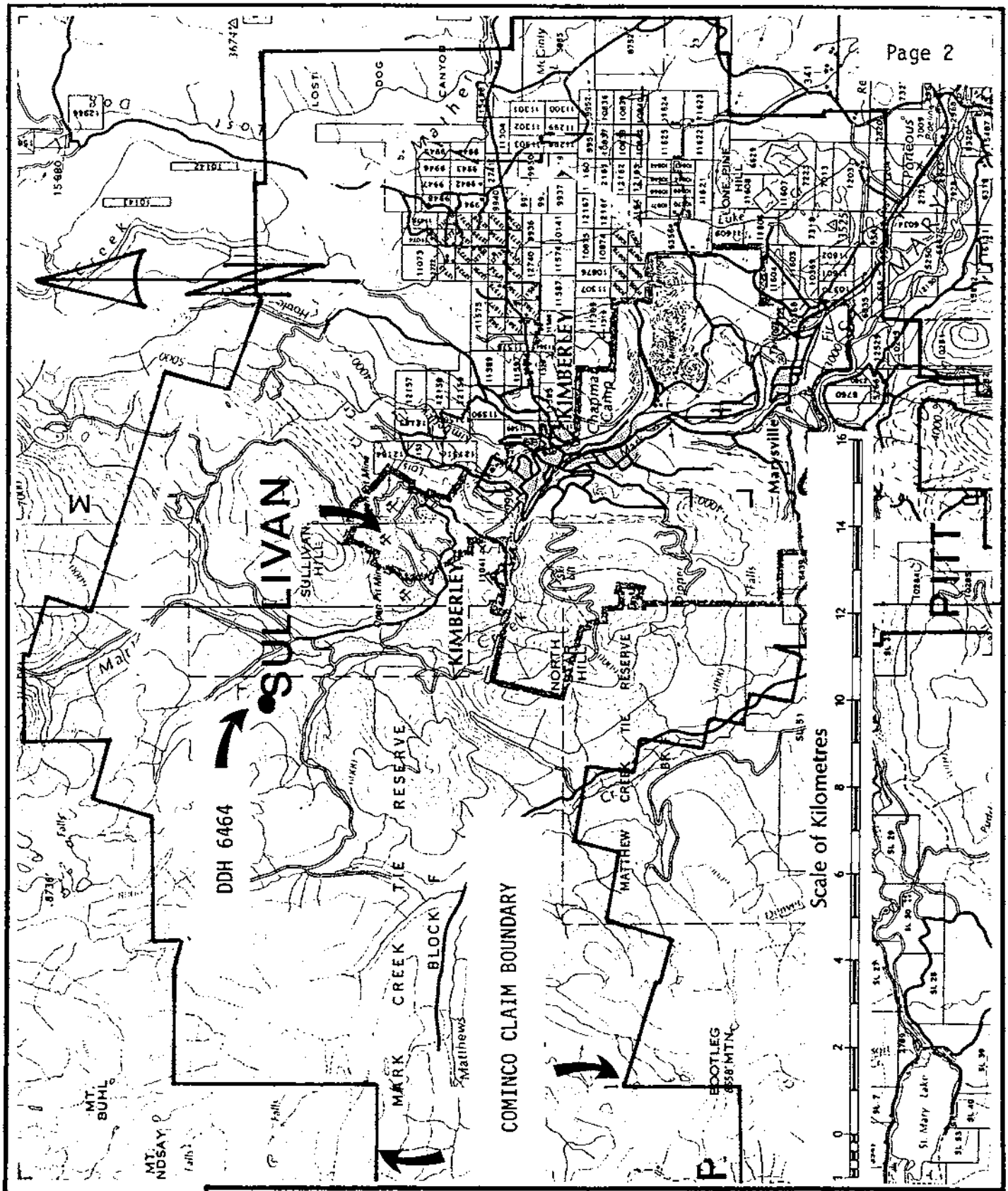
The property being investigated forms part of the Sullivan Mine claim group, owned by Cominco Ltd. Cominco has operated the mine for about 75 years. The Sullivan stratiform Ag-Pb-Zn-Fe sulphide deposit is one of the most important of its type worldwide and has contributed significantly to the mineral wealth generated in the province of British Columbia.

1.30 Drilling

One hole is being reported on. It was collared at -68° dip and was drilled to a depth of 1,738 meters using H and N wireline tools.

1.40 Claims Explored

DDH 6464 was drilled on the Telfer and Burgess Crown Granted Mineral Claims.

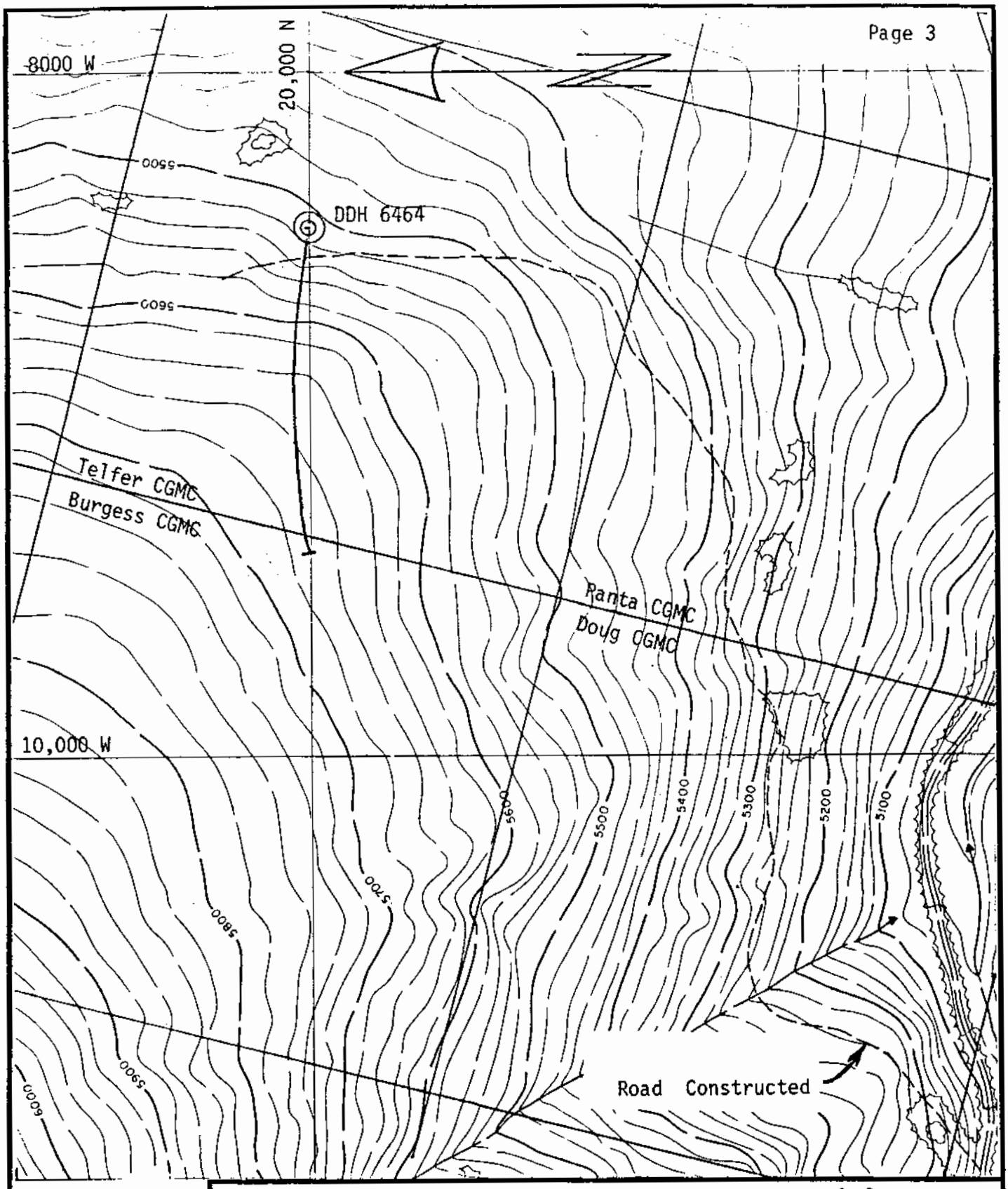


Iss'd To:	Date:

INDEX MAP

COMINCO LTD. SULLIVAN CLAIM BLOCK

Drawn by:	Scale:	Date:	Plate:
PWR	Shown	Feb. 1988	1



Iss'd To:	Date:

DRILLING SURFACE PLAN

DDH 6464

Drawn by:	Scale:	Date:	Plate:
PWR	400'	Feb. 1988	2

2.00 DETAILED TECHNICAL DATA AND INTERPRETATION

2.10 Drilling

2.11 Objective

The Objective of drilling DDH 6464 was to locate the offset continuation of the Sullivan orebody north of the Kimberley Fault.

2.12 Results

DDH 6464 was drilled to a depth of 5701 feet (1738 meters). Rocks cored are siliciclastic and argillaceous sediments and gabbro. A detailed lithologic description is given in the log, Appendix A. No chemical analytical work has been done on core from this hole.

2.13 Interpretation

The sedimentary rocks cored belong to the Middle Aldridge Formation. The gabbros are typical of Moyie intrusions, commonly found within the Aldridge Formation.

2.14 Conclusion

DDH 6464 penetrated a portion of the Middle Aldridge Formation. The bottom of the hole is estimated to be a substantial distance above the target.

Report by: P.W. Ransom

P.W. RANSOM
Project Geologist
Cominco Ltd.

Endorsed by: John Hamilton

J.M. HAMILTON
Manager, Exploration
Western Canada
Cominco Ltd.

Copies: Mining Recorder (2 copies)
Western District
Kootenay Exploration

APPENDIX A

1 Foot = 0.3048 metres

Diamond Drill Geological Log For D.D.H. 6464

LAT. 20,000'N DEP. 8,450'W ELEV. 5,500 feet
DIP: -68.5° AZIM.: 270° LENGTH: 5,701 feet
HORIZ. COMP. 975 feet VERT. COMP. 5,582 feet
DATE COLLARED: Nov. 3, 1987 DATE COMPLETED: Feb. 2, 1988
CORE STORAGE: Sullivan Mine
DRILLED ON CLAIM(S): Telfer and Burgess
OBJECTIVE: To explore for the continuation of the Sullivan orebody north of the Kimberley Fault.
PLANNED LENGTH: 6,500 feet
TERMINATION COMMENTS: Rig not capable of lowering NQ rods safely below 5,700 feet. Considering replacing rig.

DRILLED BY: Connors Drilling Ltd.
TYPE DRILL: 56HD
CORE SIZE: HQ, NQ
PERFORMANCE COMMENTS:

CASING REMAINING IN HOLE (LENGTH & SIZE): 2,030' NQ
42' HW
TYPE CAP & SEALING METHOD: 2' HW welded cap.
OTHER MATERIAL REMAINING IN HOLE:

SURVEY INSTRUMENT USED: Sperry Sun. See results to right.

ADDITIONAL DOWN HOLE TESTS: Temperature

Depth	Time thermometer on bottom	Temperature
5,578 feet	2 hours	115.5° F
5,701 feet	3 hours	118.5° F

GENERAL COMMENTS: Crew and first load arrived Oct. 28, rig arrived Oct. 31. Field Supervisor John Cantin, Drilling Forman John Corsi, Driller Richard Druske, helpers D. Goforth, Bill Gilroy, Rob Brown, cook C. Coomes. Residence at Kimbrook Crescent.

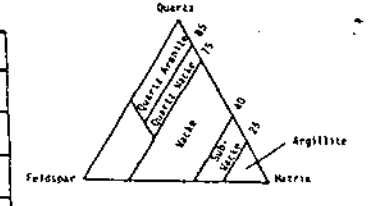
SPERRY SUN SURVEYS

Depth	Dip	Azm	Angle Unit	Depth	Dip	Azm	Angle Unit
0'	-68.0	270	90°	3901'	-84.3	260	20°
88'	-67.5	273	"	4111'	-84.1	not used	6°
498'	-70.5	279	"	4311'	-85.4	251	"
751'	-70.5	278	"	4521'	-86.0	243	"
1001'	-74.25	276	"	4719'	-86.2	261	"
1191'	-74.1	273	20°	4898'	-86.6	255	"
1391'	-75.0	268.5	"	5099'	-87.3	255	"
1611'	-77.0	262.5	"	5310'	-87.3	252	"
1801'	-77.5	261.5	"	5500'	-88.1	254	"
2011'	-78.1	261	"				
2321'	-79.1	264	"				
2521'	-80.4	262	"				
2701'	-80.4	264	"				
2911'	-80.5	263	"				
3121'	-81.5	260	"				
3311'	-82.2	262	"				
3521'	-83.0	262	"				
3701'	-84.0	260	"				

LOG LEGEND

BED THICKNESS CLASSIFICATION

BEDS	Very Thick Bedded	
	100 cm	
	Thick Bedded	
	30 cm	
	Medium Bedded	
	10 cm	
	Thin Bedded	
	3 cm	
	Very Thin Bedded	
	1 cm	
LAMINAE	Laminated	
	0.3 cm	
	Thinly Laminated	



LITHOLOGIC CLASSIFICATION

D.D.H. 6464

Drill Hole Record

Cominco Page 2

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Hole No. | Sheet

Analysis

Footage From	To	Description
0.0	14.0	Overburden
14.0	243.0	Wacke, subwacke and argillite; dark grey and medium grey; thin bedded with a few medium beds; bed contacts sharp and flat; about 70% of interval is laminite most of which is very dark grey with extremely thin laminae and which contains fine pyrrhotite, some beds are light grey with more widely spaced black laminae and with minor disseminated pyrrhotite, graded beds are present some with flat parallel current (?) lamination others without and most of which have minor disseminated pyrrhotite especially near the bases. The latter beds grade up, in some cases gradually and in others across a planar contact, into distinct argillite. In some sections, distinct argillite also occurs as the only lithotype alternating with the dark laminite. Two thick wacke/subwacke beds from 157.5 to 159.3 and 189.0 to 190.5 contain a few lithic clasts. Calcite is present as pale grey phenocrysts in many of the subwacke and wacke beds and in rare lisy intervals up to a few cm long. Bedding to core 60° @ 18', 55° @ 32', 60° @ 61', 59° @ 87', 58° @ 115' 55° @ 140', 56° @ 170', 58° @ 196', 56° @ 223'.
243.0	264.0	Lithology described above continues with addition of quartz arenite that is light grey, fine grained and calcareous and containing some fine pyrrhotite, especially at the base. This new lithotype is not abundant, the two thickest beds are 243.0 to 243.7 and 246.0 to 247.1; it or quartz wacke forms the thin bases (less than 2 cm) of a few graded beds. Bedding to core 56° @ 264'.
264.0	336.0	Wacke, subwacke and argillite, much like first interval, medium to dark grey; thin bedded with rare medium beds; bed contacts sharp and flat; dark grey laminite with extremely thin laminations and very fine pyrrhotite alternate with (usually) beds graded from wacke to argillite. Of the latter the gradation may be imperceptable or abrupt with sharp internal contacts. Several beds noted with dark grey elongate

211-8437

Drill Hole Record

Cominco Page 3

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Hole No. | Sheet

Analysis

Footage From	To	Description
264.0 (Cont'd.)	336.0	lensoid material in a lighter matrix, similar beds may have been precursors to laminites produced by dissolution stylolitization (267'). From 290 - 291' is an irregular wacke/subwacke with rip-up clasts and scattered pyrrhotite. Small pale grey calcite phenocrysts are common. Chlorite calcite vein @ 329'. Bedding to core 55° @ 276', 57° @ 303', 55° @ 332'.
336.0	410.0	Wacke, subwacke and argillite; medium and dark grey; medium and thin bedded; bed contacts sharp and flat; beds graded to argillite alternate with laminites and both may have some fine weakly disseminated pyrrhotite. Small pale grey calcite phenocrysts noted. The graded beds are generally quite homogeneous however some have Bouma B type lamination usually in the lower portion. Bedding to core 57° @ 352', 57° @ 359', 58° @384', 59° @ 407'.
410.0	632.0	Wacke, subwacke and argillite; medium grey; thick bedded with thin and medium beds single or in small clusters; bed contacts are sharp to vague and flat; most beds are featureless with only subtle grading, very few laminites noted. Portion of very thick bed at 566' is convoluted. Pyrrhotite is rare in scattered weak disseminations or near some bed bases. Three beds between 581 and 587' contain elongate pyrrhotite wisps throughout. Bedding to core 55° @ 431', 57° @ 465', 59° @ 491', 58° @ 517', 59° @ 545', 56° 575', 64° @ 600', 61° @ 613'.
632.0	897.5	Quartz wacke and minor quartz arenite 60% of interval, wacke, subwacke and argillite; medium and light grey; thick and very thick bedded, medium beds are common and thin beds are present; bed contacts are sharp to distinct and wavy to irregular; most beds are graded to subwacke or argillite on top commonly with narrow intervals of reverse grading at bases, flame structures and convoluted bedding are common, there are occasional rip-up clasts. Short intervals of thin and medium beds (less than 5') are present and contacts vary from flat to irregualr. From 825 - 826' is a clacite, biotite chlorite alteration zone (concretion?). From 768.0 -768.5 crumbly core and 10 cm gouge, strong slickensides on surface parallel to bedding. Bedding (where flat) to core 55° @ 660', 56° @ 701', 67° @ 741', 72° @ 804', 67° @ 856', 73° @ 885'.

211-84

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From	To	Description
897.5	909.0	Wacke, subwacke and argillite; medium to dark grey; thin to very thin bedded; contacts sharp to distinct and wavy to flat; beds are graded, bases have flame structures, some faint cross laminations. Bedding to core 70° @ 903'.
909.0	934.0	Quartz wacke, wacke, minor subwacke and argillite; medium to light grey; thick and medium bedded; contacts sharp to distinct and flat, a few have small scale irregularities and one good load structure; beds are featureless except for grading. Minor bleaching on some fractures. At 922' is 10 cm zone of breccia and gouge parallel to bedding; slickensides on enclosing bedding surfaces (thrust?). Bedding to core 71° @ 923'.
934.0	1082.0	Intervals of quartz wacke, quartz arenite and wacke alternate with intervals of wacke, subwacke and argillite. The former are medium and light grey; thick and medium bedded; contacts are sharp to distinct and vary from flat to wavy or irregular; beds are featureless except for grading and tops are usually subwacke or argillite. The shorter intervals are medium and dark grey; medium, thin bedded and laminated; contacts are sharp to distinct, wavy to flat; beds are graded, some are laminites. Intervals of thinner beds are: 934.0 - 937.0'; 940.0 - 950.0'; 951.0 - 953.0'; 962.0 - 973.0'; 977.0 - 980.0'; 993.0 - 996.0'; 1008,5 - 1018.0'; 1020.0 - 1025.0'; 1036.4 - 1037.2'; 1042.3 - 1044.5'; 1046.5 - 1050.0'; 1056.5 - 1058.5'; (Run 1059.0 - 1061.5' is 1.5 feet short); 1071.5 - 1079.8. Bedding (where flat) to core: 70° @ 935'; 70° @ 966'; 70° @ 989'; 70° @ 1015'; 68° @ 1037'; 60° @ 1049'; 67° @ 1079'.
1082.0	1129.0	Wacke, subwacke and argillite; medium and dark grey; medium, thick and thin bedded; contacts sharp and flat; many beds graded, the coarsest (approach quartz wacke composition) generally have current laminations (Bouma B) and as well have disseminated pyrrhotite (represent about 25% of interval) - one bed 1104.0 - 1104.5' has pyrrhotite grains up to 3X5 mm at base and that grade in size to minute at the top. Also present are dark grey laminites and distinctive homogeneous subwacke/argillite bed tops. Bedding to core 74° @ 1086'; 68° @ 1111'; 70 @ 1128'.

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From	To	Description
1129.0	1168.0	Quartz arenite, quartz wacke with, from 1143.0 - 1160.5', wacke, subwacke and argillite; medium and light grey; quartz arenite/ quartz wacke is thick and medium bedded; bed contacts sharp to distinct and flat to undulating; quartz arenite/ quartz wacke beds are graded otherwise featureless. Wacke/argillite beds are medium to thin bedded; contacts sharp to distinct and flat to undulating; a thick and several medium beds have shreds and clasts of argillite indicative of resedimentation. Bedding to core 71° @ 1143', 65° @ 1160'.
1168.0	1523.0	Wacke, subwacke and argillite; medium with some dark grey; medium and thin bedded with a few isolated thick beds; bed contacts are sharp and flat; grading is common often with disseminated pyrrhotite in bed bases and more weakly disseminated above, many of the thin beds are dark grey laminites, base of a thick bed at 1884' has Bouma B current laminations, medium beds of predominantly argillite have wacke wisps containing disseminated pyrrhotite, medium wacke bed at 1209' is calcareous and contains medium and fine quartz sand grains, medium beds of quartz wacke from 1226 - 1229', portion of a thick bed from 1286 - 1289' contains argillite clasts up to 1X4 cm in size and coarse (1-5 mm) grains of pyrrhotite disseminated throughout (and a 2 mm wide pyrrhotite-calcite fracture). From 1290 to 1510' bedding to core angle changes radically as large fold is penetrated, core in about 25% of this interval is badly broken. Pyrrhotite was noted in 1-3 mm seams on several bed contacts and rarely in veinlets. Broken core 1290 - 1336' with short segments of good core, gouge in intervals from 1326.5 - 1330.0, broken 1465 - 1508' with fair intervals. Bedding/with cleavage if present in opposite sense to bedding: 74° W 1169'; 67° @ 1179', 71° @ 1195'; 71° @ 1211'; 75° @ 1237'; 74° @ 1258'; 74° @ 1269'; 75° @ 1284'; 53° @ 1294'; 57° @ 1297'; 47°/300° @ 1300'; 40° @ 1301'; 15° @ 1302'; 69/250°(?) @ 1305'; 22° @ 1306'; 140/330°(?) @ 1309'; 0° from 1310-1312'; 49/210° @ 1313', passes 90° in irregular zone at 1315' to 30°/320° at 1315', 90° @ 1317'; 0° @ 1317.5'; 90° @ 1318'; 46° @ 1319'; 46°/400° @ 1324'; 30° @ 1329'; 22° @ 1337'; 26° @ 1342'; 25° @ 1346'; 22° @ 1353'; 25° @ 1362'; 300/400° @ 1375'; 30° @ 1381', 28° @ 1389'; 300/400° @ 1399'; 24° @ 1407'; 19° @ 1417'; 30°/390° @ 1420'; 17° @ 1427'; 25° @ 1433', 24° @ 1451'; 24° @ 1464'; 17° @ 1472'; 34°/400° @ 1482'; 54°/310° @ 1492', 59°/310° @ 1500', 62°/400° @ 1517'.

Property Sullivan	District Western	Hole No. DDH6464	
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Completed	Core Size	Corr. Dip	Vert. Comp.
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Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length

Analysis

Footage From	To	Description
1523.0	1593.0	Quartz wacke and quartz arenite with intervals of wacke, subwacke and argillite. The former is light to medium grey; grains to fine sand size; thick, rarely medium bedded; contacts distinct to vague, most flat, some load features; Bouma AE beds, E portion is very minor. Alteration comprises minor silica enrichment along fractures, some quartz veinlets, patchy chlorite sericite. The wacke, subwacke and argillite, from 1539' - 1544', 1548 - 1564' and 1570 - 1576' is medium dark to dark grey; medium and thin bedded with some thick beds; contacts generally sharp and flat; beds are graded. Thick subwacke and argillite beds between 1584 and 1588' contain pyrrhotitiferous wacke dikes 0.5 to 1.5 cm wide, the dikes have been foldud and separated into segments during compaction, pyrrhotite content is up ot 50%. Pyrrhotite and pyrite noted on fractures, most often parallel to bedding. Bedding to core: 68° (irregular) @ 1523', 70° @ 1539'; 69° 1552'; 65° @ 1562'; 65° @ 1570' and 69° @ 1575'.
1593.0	1789.0	Wacke, subwacke and argillite; medium and dark grey; 1593.0 - 1630.0' thin bedded; bed contacts sharp and flat or undulating; graded beds alternate with dark laminites; graded bases often have disseminated pyrrhotite and some are cross laminated (Bouma CE and CDE beds). 1630.0 - 1674.0' medium and thin bedded, few thick beds; of latter one is vaguely laminated wacke, another mostly wacke/subwacke with disseminated and blebs of pyrrhotite with a quartz wacke base overlying a medium quartz wacke bed (1664'). 1674.0 - 1680.0' thin bedded; contacts sharp and flat; small fold faulted at 1675.0. 1680.0 - 1712.0' medium and thin bedded, three thick beds; most beds graded, many of the wacke bases have weak disseminated pyrrhotite. Thin laminates frequently separate beds; bed contacts sharp to distinct and flat, rarely wavy. Disaggregated bed of argillite and subwacke at 1710'.

Property Sullivan	District Western	Hole No. DDH6464	
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Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length

Analysis

Footage From	To	Description
1593.0	1789.0 (Cont'd.)	1712.0 - 1718.0 two thick beds separated by 2.5' of thin beds. Both thick beds are disaggregated, most likely resedimented. Upper one is approaching quartz wacke composition and has numerous granule and slightly larger argillite and subwacke clasts in the basal half and scattered pyrrhotite throughout. Lower one is mostly argillite with fine wisps of slightly pyrrhotitic subwacke. 1718.0 - 1784.0 thin bedded with quite a few medium beds; dark grey laminites alternate with medium grey beds predominantly argillite with bases that grade from subwacke or wacke. Most of these bases and the few wacke/subwacke wispy layers in the argillite have disseminated pyrrhotite and in more weathered looking layers pyrite (often with minor calcite). Pyrrhotite is up to 50% across 1 cm. One quartz arenite sandstone dike cuts bedding near 90° @ 1771 - 1772'. 1784.0 - 1789.0' Argillite and subwacke and wacke, one or two graded intervals within which a faint lamination throughout is accentuated by disseminated pyrrhotite clustered and sometimes elongated grains of which are aligned parallel to bedding. Bedding to core: 55° @ 1597'; 55° @ 1608'; 55° @ 1625' with cleavage pyrrhotite in bed base with dip in opposite sense to bedding, at 12° (true dip of bedding is most likely 48° easterly); 61° @ 1640'; 58° @ 1660'; 60° @ 1662' with cleavage pyrrhotite in quartz wacke with dip opposite to bedding at 23° (true dip of bedding probably 43° easterly); 50° @ 1672'; 60° @ 1674' through 0° in fractured and faulted fold and back to 47° @ 1675'; 53° @ 1680'; 59° @ 1690' with cleavage pyrrhotite in quartz wacke with dip opposite to bedding at 26° (true dip of bedding probably 44° easterly); 58° @ 1705'; 58° @ 1720'; 49° @ 1730'; 50° @ 1740'; 52° @ 1753'; 52° @ 1760' with cleavage pyrrhotite in subwacke with dip opposite to bedding at 28° (true dip of beds probably 51° easterly).
1789.0	1917.5	Quartz arenite and quartz wacke with some bed tops and a few beds of wacke, subwacke or argillite, intervals predominantly or entirely quartz arenite 1831.0 - 1865.0' and 1889.0 - 1917.5'; medium to light grey, some of the quartz arenite is dark grey; medium and fine grained; thick and very thick bedded with a few medium beds,

Drill Hole Record

Cominco Page 8

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From	To	Description
1789.0	1917.5 (Cont'd.)	some intervals are amalgamated beds; bed contacts vary but most are distinct and flat to wavy, some irregular; most beds are 95% or more Bouma A turbidites, a few quartz wacke beds near start contain pale grey argillite rip-up clasts; pyrrhotite is rare but present in veinlets near top and bottom of interval and in bed bases in a predominantly wacke interval 1865.0 - 1889.0'. Brittle white fractures below 1890' and a few chlorite veinlets below 1900.0'. Bedding to core: 23° @ 1803', 37° @ 1806', 72° @ 1814', 60° @ 1830', 55° @ 1866', 55° @ 1872' with scattered cleavage chlorites at about 13° average in opposite sense to bedding, 53° @ 1885', 40° and 45° @ 1900'.
1917.5	2116.0	Gabbro, dark green, medium and coarse grained with a 3 foot fine grained base. Top contact is sharp and at 40° to core; basal contact is sharp and at 65° to core. There are a few quartz veins up to 10 cm wide, some contain feldspar, biotite, chlorite and rarely pyrrhotite and most are brecciated and healed.
2116.0	2211.0	Wacke, subwacke and argillite with several beds of quartz wacke to 2135.0; medium and dark grey; medium and thin bedded with some thick beds to 2135.0; bed contacts sharp and flat; grading is common however some units of argillite as well as the usual dark grey laminites show no internal variations, there are a few isolated rip up clasts of argillite. Pyrrhotite is sometimes present disseminated in portions of the wacke beds, in particular at the base and in silty wisps and laminations, the basal 1 to 5 mm of some beds contains greater than 50% pyrrhotite. Biotite alteration due to intrusion noted to 2135.0'. Bedding to core 73° @ 2119', 52° @ 2138', 53° @ 2154' with cleavage pyrrhotite at 27° in opposite sense to bedding, 59° @ 2179', 59° @ 2195', 58° @ 2210' with cleavage, pyrrhotite at 23° in opposite sense to bedding.
2211.0	2308.0	Wacke and quartz wacke (rarely quartz arenite) alternates with intervals of subwacke and argillite with some wacke; medium grey; the former is thick and medium bedded, latter is medium and thin bedded; bed contacts are sharp to distinct and flat to wavy; a few beds have argillite wisps and some appear disaggregated, probably have been resedimented. Pyrrhotite is almost absent, cleavage chlorites are common.

Drill Hole Record

Cominco Page 9

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From	To	Description
2211.0	2308.0 (Cont'd.)	The medium and thin bedded subwacke intervals are: 2234-2240', 2255-2263', 2268-2273', 2280-2285', 2300-2304'. 15 cm gouge zone, mostly clay with about 10% small fragments <0.5 cm. Bedding to core 55° @ 2237' with cleavage chlorites at 20° opposite sense to beds, 50° @ 2280' with cleavage chlorites at 11° in opposite sense to beds, 55° with cleavage chlorites in opposite sense at 15°.
2308.0	2325.0	Subwacke and argillite (one medium bed of quartz wacke); medium grey with dark grey intervals from 2309-2314' and 2318-2320'; medium to thin bedded and laminated, bed contacts and laminations are sharp and flat, faint calcite laths and rhombs in upper dark zone, good cleavage chlorites in lighter grey argillites and some disseminated pyrrhotite in siltier parts of beds. Pyrrhotite blebs and coarse disseminations in medium and thin beds 2321-2325'. Bedding to core 51° with cleavage chlorites 20° opposite at 2309', 53° with cleavage chlorites 19° opposite at 2321'.
2325.0	2351.0	Quartz wacke (as part of thick beds above 2336') wacke and subwacke, minor argillite; medium grey; thick and medium (rarely thin) bedded; bed contacts sharp to distinct and flat (rarely slightly wavy); some bases of beds are fine grained, most beds are graded. Pyrrhotite is usually disseminated throughout the thick quartz wacke beds and in siltier bases of other beds. Bedding to core 54° with cleavage chlorites 18° opposite at 2339'.
2351.0	2435.0	Wacke, subwacke and argillite, calcareous; medium and dark grey; thin (more in upper half of interval) and medium bedded; bed contacts are sharp and flat; beds are graded, typically with pyrrhotite disseminated in the wacke portions, particularly near the bases; dark grey laminites 1 to 10 cm thick alternate with the graded beds. About 70% of interval, both graded beds and laminites, is weakly to moderately calcareous. From 2420-2435' limy wacke bases (50%) are cross laminated (several sets 2422-2423'). Lithic wackes with clasts to 0.5 X 2 cm from 2403.5 - 2404 with wavy bed contacts appear to be resedimented. Bedding to core/with pyrrhotite cleavage in opposite sense: 490/18° @ 2355', 530/24° @ 2378', 520/29° @ 2410', 520/28° @ 2425'.

Drill Hole Record

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Sheet

Footage From	To	Description	Analysis
2435.0	2520.0	Wacke, quartz wacke, subwacke and argillite (not calcareous); predominantly thick bedded wacke and quartz wacke with intervals of medium and thin bedded wacke, subwacke and argillite from: 2445.5-2447.0, 2484-2488', 2495-2498' and 2512-2516', medium grey, bed contacts are sharp to distinct and flat, a few appear to have been disturbed, most beds are graded, two sets of calcareous cross beds are present (2474', 2513'). From 2500-2502' is top portion of a thick graded bed that is disaggregated argillite and subwacke, appears resedimented. Pyrrhotite is present but only weakly disseminated and within cleavage near bed bases, rare cleavage chlorites noted in argillite tops. A 4 cm quartz vein at 2468' contains some coarse pyrrhotite and chlorite. Bedding to core/with cleavage in opposite sense: 45°/30° @ 2454', 52°/24° W 2484', 50°/25° @ 2503', 47°/32° @ 2519'.	
2520.0	2583.0	Wacke, subwacke and argillite, calcareous; medium and dark grey; thin and medium bedded; bed contacts are sharp and flat; graded beds alternate with relatively thinner dark grey laminites. About 50% of interval is calcareous, the most calcareous are light grey laminated bases some of which have fine irregularities and are probably dissolution stylolites; also quite limy are intervals to 10 cm that have uniform medium grey matrix and wavy or discontinuous white calcite. This latter texture appears to be tectonic and appears to be an end member of textures that grade to bedding parallel calcite seams. Chloritic partings, sometimes with slickensides, and small gouge zones, were noted parallel to bedding. Short limy cross bedded zones are present but rare. One quartz wacke, medium bed, noted at 2535' has a convoluted upper portion (wacke overlain by argillite) however the argillite top is flat. Pyrrhotite, typically accentuating cleavage, is noted in most bed bases, including those that are limy. Bedding/cleavage in opposite sense to bedding, to core: 51°/22° @ 2521', 49°/27° @ 2548', 38°/19° @ 2582'.	
2583.0	2600.0	Quartz wacke, wacke, subwacke and minor argillite, possibly a little quartz arenite; medium grey; medium bedded with a few thin beds above 2593' and thick beds below 2595'; bed contacts sharp to distinct, some are flat most wavy or irregular (no	

Drill Hole Record

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Footage From	To	Description	Analysis
2583.0	2600.0 (Cont'd.)	dark laminites is main distinction between upper 10' of this interval and preceeding). Minor pyrrhotite disseminated in the quartz wacke. Interval is not calcareous. Bedding/cleavage, in opposite sense to bedding, to core: 46°/32° @ 2598'.	
2600.0	2612.0	Wacke, subwacke, and argillite, (not limy); medium grey; thin to thick bedded; weak narrow dark laminites developed; bed contacts sharp and flat (two are convoluted), two sets of cross beds, one limy, noted; beds graded, one thick bed contains fine argillite rip-ups and is probably resedimented.	
2612.0	2635.0	Quartz wacke and quartz arenite (more of a guess from 2623.0 - 2635.0 as core is soaked in diesel); light grey; thick bedded; pyrrhotite noted in graded bed bases below 2628'. Quartz vein less than 10 cm wide cuts core at 12°. Bedding/cleavage, in opposite sense to bedding, to core 42°/35° @ 2630'.	
2635.0	2653.0	Wacke, subwacke and argillite with narrow limy units, medium grey; medium, some thin bedded; bed contacts are sharp and flat; beds are graded, tops of some are convoluted indicating minor resedimentation, a few narrow dark grey laminites are present. 10 cm gouge and broken core at 2538' narrow gouge zones, some parallel to bedding, at 2653'. Bedding/cleavage, in opposite sense to bedding, to core 48°/12° @ 2652'.	
2653.0	2658.0	Argillite with wisps of subwacke; light grey; bedding not always clear but some thin and very thin beds noted, some are contorted, pyrrhotite is present often concentrated in laminations and in some of the contorted subwacke.	
2658.0	2802.0	Wacke, subwacke and argillite with numerous beds of quartz wacke, often calcareous; medium and dark grey; typically thin bedded with few medium and rare thick beds; bed contacts are sharp and flat; typically graded beds alternate with relatively thinner dark grey laminite, the graded beds often have limy bases some of which also have cleavage pyrrhotites and others have faint cross laminations. Three thin isolated limy medium grained quartz arenite beds occur over 15 cm at 2780'.	

Drill Hole Record

Cominco

Property Sullivan	District Western	Hole No. DDH6464	
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Analysis

Footage From	To	Description
2658.0 (Cont'd.)	2802.0	Portion of small fold cored over 15 cm at 2722'. Bedding/cleavage in opposite sense to bedding, to core: 45°/27° @ 2673', 53°/23° @ 2708', 52°/21° @ 2730', 45°/28° @ 2750', 50°/10° @ 2775', 49°/29° @ 2801'.
2802.0	2819.0	Quartz wacke and quartz arenite and altered (silicified) sediments, medium grey; thick bedded with thin beds from 2812 - 2815'. Biotite development with strong bleaching along fractures 2814 - 2819'.
2819.0	2880.0	Gabbro, upper contact is about 50° to core, lower contact is not distinct (appears to be gradational and incorporates some sedimentary material from 2878 - 2880'). Chilled contact with amphibole phenocrysts to 5 mm long 2819 - 2824', then fine grained to 2829. Most of interval is medium to coarse grained with a few quartz veinlets and calcite veinlets. Fine grained lower portion 2875 - 2879'.
2880.0	2914.0	Wacke, subwacke and argillite; light medium grey; medium and thin bedded; bed contacts sharp and flat; beds are graded, bases of some beds have one to three cm of limy quartz wacke a couple of which are cross laminated. Limy cross laminations noted in central portion of one bed. Most of this interval is bleached and fine biotite is developed in the wackes, the biotite highlights even parallel laminated basal and central portions (Bouma B?) of most beds. Bedding to core 52° @ 2888', 55° @ 2900', 50° with subtle pyrrhotite cleavage of 28° in opposite sense to bedding at 2903', 48° @ 2914'.
2914.0	2926.5	Calcareous quartz arenite and quartz wacke with minor (est. 20%) wacke, subwacke and argillite; medium and light grey; to coarse grained; thick and medium, with about 20% thin, bedded; bed contacts are sharp and flat to irregular, one erosional; beds are graded, thickest have Bouma A bases. Some disaggregated beds, and apparently, some slumped beds (based on low core angle). Bedding to core: 57° @ 2916', 48° @ 2921', 45° @ 2916', 50° @ 2926.5'.

811-843

Drill Hole Record

Cominco

Property Sullivan	District Western	Hole No. DDH6464	
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Analysis

Footage From	To	Description
2926.5	2933.0	Wacke, subwacke and argillite, more quartzitic portion of lowest bed is calcareous; two medium beds separated by thin bedded argillite and subwacke, portions of which are disaggregated. The two medium beds contain shredded wisps and clasts of argillite.
2933.0	2941.0	Quartz arenite with portions weakly calcareous; medium grey; to medium grained; thick bedded, 3 cm of gouge at 2935.5' may be sheared argillite, if so then two beds. Base is a quartz wacke (20 cm); this is essentially a Bouma A turbidite(s?).
2941.0	2976.0	Wacke, subwacke and argillite, wacke proportion increases with depth, with isolated medium beds of medium grained calcareous quartz arenite and quartz wacke from: 2948-2942' (two 15 cm beds), 2950.5-2952.0' (single bed), 2955.3-2956.5', 2959.5-2964.0' (4 beds), 2972.0-2974.0' (two beds). Medium to dark grey, medium and thin bedded, bed contacts are sharp and from flat (most) to wavy and irregular, both graded beds and dark grey laminites are present and from 2971.0 - 2971.5' are several sets of calcareous cross laminations. Bedding/pyrrhotite cleavage, in opposite sense to bedding: 54°/15° @ 2946', 52°/28 @ 2966', 50°/36° @ 2976'. 0.5 to 1.0 cm of 50% pyrrhotite at base of thin quartz wacke bed between laminites at 2970'.
2976.0	3028.0	Quartz arenite, minor quartz wacke, wacke, subwacke and argillite; light grey; coarse, some very coarse grained; very thick bedded, amalgamated; bed contacts vague and irregular, argillite rip-up clasts and contorted bed tops.
3028.0	3034.5	Wacke, subwacke and argillite; thin bedded; with two thin beds of quartz arenite; medium grey; bed contacts sharp and flat to wavy (load features on the quartz arenite); beds graded, some thin laminites, 5 cm calcareous cross laminated zone; fine disseminated pyrrhotite in narrow silty layers, some in cleavage and a 2 mm thick layer at base of the quartz arenite bed. Bedding/cleavage, in opposite sense to bedding: 55°/15° @ 3031'.
3034.5	3041.0	Quartz arenite, calcareous; coarse grained, light grey, two beds, 3034.5 - 3036' and 3036 - 3041', contact diffuse, the thick bed is coarse grained except top 6".

811-843

Scale

Colour Plot & Dips

Drill Hole Record

Cominco

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
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Claim | T Brg. | Collar Dip | Elev. | Length

Footage From To | Description | Analysis

3041.0 - 3096.0 Wacke, subwacke, argillite and quartz wacke, calcareous; to medium grained; medium and dark grey; thin bedded with less than 20% of interval medium bedded; bed contacts sharp and flat (generally) to wavy; graded beds usually alternate with dark grey laminites 1 to 10 cm thick, the quartz wacke bases are usually calcareous and many contain disseminated pyrrhotite. In the basal portions, pyrrhotite is often concentrated in 2 or 3 mm wide zones at the base and it also is present in the cleavage. Calcite fractures below 3075', brownish appearance of some beds noted below 3085' (biotite). Massive biotite for 10 cm cuts bedding at 45°. Bedding/cleavage, in opposite sense to bedding: 50°/200° @ 3045', 45°/100° @ 3054', 36°/330° @ 3060', 42° to 130° on cleavage parallel break of 40°, at 3064' (over 5 cm), 50°/220° @ 3065.5', sudden change at 3066', 0°/45° @ 3066' for 10 cm, 230°/40° (necessary to rotate core about 45°) @ 3067', 220°/43° @ 3076', 230°/45° @ 3082', 0° @ 3082.5, then several fold hinges to 3084', 350°/40° @ 3084.2, 350°/35° @ 3120'.

3096.0 - 3122.0 Gabbro, fine to medium grained; chilled upper margin with amphibole phenocrysts and some biotite; considerable biotite 3120 to 3122' with chilled lower margin containing amphibole phenocrysts. Upper contact 43°, lower contact is sharp at 66°.

3122.0 - 3189.5 Wacke, subwacke and argillite with calcareous zones, medium and dark grey; medium bedded with a few thin beds; bed contacts are sharp and flat; many beds are graded and often have a calcareous laminated base, dark grey laminites up to 30 cm thick commonly separate the graded beds. Bedding/cleavage, in opposite sense to bedding: 41° @ 3122.5', 250° @ 3150', 190/270° @ 3153', 160/500° @ 3155', 220° @ 3162', 200/350° @ 3166', 140/450° @ 3171', 300/400° @ 3182', 400/370° @ 3187'.
Fault zone: 3169 - 3182' core is shattered with short intervals of breccia and or gouge. A few calcite veinlets occur.

3189.5 - 3262.0 Quartz arenite, quartz wacke with substantial wacke below 3235'; some beds fine grained, medium grey (dark when wet) with the wacke dark grey; thick bedded with some medium beds below 3275'; bed contacts sharp to vague, the sharp ones are flat; beds are graded and some have argillite tops, dark grey laminites up to

211-843

Scale

Colour Plot & Dips

Drill Hole Record

Cominco

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Commenced	Location	Tests at	Hor. Comp.
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Footage From To | Description | Analysis

3189.5 - 3262.0 (Cont'd.) 20 cm wide 3240 - 3243'. No cleavage observed. Below 3250' pyrrhotite is disseminated in wisps to 0.5 cm wide and concentrated in a few thin quartz wacke beds. Bedding to core 75° @ 3203', 58° @ 3211', 71° @ 3220', 74° @ 3236', 76° @ 3241', 75° @ 3260'.
3199 - 3220' Core shattered, some incohevise weakly sheared zones, some slickensides parallel to bedding. Crush breccia and gouge 3216.5 - 3220'.

3262.0 - 3307.0 Wacke, dark grey and light grey, laminated throughout, rare thin bed. Bedding to core 74° @ 3270', 75° @ 3300'.

3307.0 - 3415.0 Wacke is predominant, with quartz arenite, quartz wacke, subwacke and argillite; medium to light grey; thick and medium bedded; bed contacts sharp to distinct, rarely diffuse, and flat to wavy; most beds are graded to argillite, some argillite tops and rare sets of argillaceous thin beds are convoluted, a few lithic clasts noted in first 10', calcareous concretions noted at wide spaced intervals. Cleavage pyrrhotite noted in first 15' then cleavage chlorite is commonly developed in argillaceous zones; it dips in opposite sense than bedding. Slickensides and small gouge zones are developed on several bed contacts. Bedding/cleavage to core: 75°/110 @ 3315', 74° @ 3342', 62°/25° @ 3360' (bedding irregular here), 70°/120 @ 3408'.

3415.0 - 3424.0 Subwacke and argillite; medium grey with some dark grey 3415 - 3417'; thin and very thin bedded with medium beds below 3421'; bed contacts are sharp to 3421', then diffuse, and flat. Cleavage chlorites throughout dip in opposite sense to bedding. Bedding/cleavage to core: 75°/37° @ 3420'.

3424.0 - 3465.0 Quartz wacke, some quartz arenite, wacke, subwacke and argillite; medium and fine grained; medium and light grey; thick bedded with medium and thin beds 3424 - 3430' and rarely below; bed contacts sharp to diffuse and flat to irregular; beds are grded, primarily AE turbidites. Calcareous patches are present in some of the thicker beds; these patches are irregular and appear to be an alteration;

211-843

Drill Hole Record

Cominco

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
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Analysis

Footage From	To	Description
3424.0	3465.0 (Cont'd.)	there are also intervals of quartz arenite that have a weakly calcareous interstitial fill. From 3438 to 3444', primarily quartz arenite and some argillite, is a partially healed crush zone. Gouge and slickensides noted on bed contacts at 3444.5 and 3455'. Bedding/with cleavage dipping in opposite sense: 80°/25° @ 3445'.
3465.0	3486.0	Wacke, subwacke and argillite with minor quartz wacke; medium grey; medium bedded with few thin beds; bed contacts generally vague, some are flat; slickensides and minor gouge noted on a few bedding planes and some fractures. Bedding/cleavage, dipping in opposite sense to bedding: 78°/31° at 3479'.
3486.0	3501.0	Quartz wacke, some quartz arenite, wacke, subwacke and argillite; fine grained; light grey; thick bedded; bed contacts sharp to gradational and flat to wavy; beds are graded, through to argillite, some beds have unsorted (wacke) bases; some beds have pale calcareous patches and some quartz arenites have weakly calcareous intervals in which fine interstitial calcite grains are present. Bedding to core 73° @ 3497'.
3501.0	3519.0	Wacke, subwacke and argillite; medium to light grey; medium and thin bedded, two thick beds; bed contacts sharp to diffuse and flat to wavy; one flame noted; beds are graded (AE turbidites) with some beds having irregular bleached (one calcareous) patches. Bedding to core is 80° with cleavage dipping 30° in the opposite sense, at 3505'.
3519.0	3575.0	Quartz wacke, wacke, subwacke and argillite; fine grained; medium grey; thick bedded with a few medium beds; bed contacts sharp to distinct and flat, wavy and irregular (some flames); beds are graded, AE turbidites. A few dark argillite clasts noted in wacke portion of thick bed at 3565'. Bases of most beds are quartz wacke. Slickensides noted on many bed contacts. Bedding/cleavage, dipping in opposite sense to bedding, to core: 84°/26° @ 3550'.

811-0437

Drill Hole Record

Cominco

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
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Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Hole No. | Sheet

Analysis

Footage From	To	Description
3575.0	3599.0	Wacke, subwacke and argillite with about 10% quartz wacke; medium grey; medium and thin bedded (the quartz wacke beds are thick); bed contacts distinct to vague and flat to irregular; many beds are graded however there are some argillite dominated intervals in which internal features are obscured by bit grooving. Slickensides are commonly developed on bedding contacts and on fractures subparallel or at a small angle to bedding. Very small scale tectonic folds and thrusts are developed in the argillaceous intervals. Cleavage chlorites are plentiful. Bedding/cleavage (sense relative to bedding) to core: 72° to 14° on opposite limb/22° (in same sense as 72° limb and opposite the 14° limb) @ 3577', 75°/22° (opposite) @ 3589', 84° (enveloping small thrusts)/36° (same), 43° and 24° (in same sense on overturned limb)/39° (same, axial planar) @ 3598.5'.
3599.0	3620.0	Fault zone, 10 feet of core loss, core is shattered with 3 incohesive zones recovered. Predominant lithotype is wacke. Slickensides are not as abundant as might be expected, but they are most strongly developed parallel to bedding, sometimes parallel to cleavage or other fractures sub-parallel to bedding. On one steep highly polished slickenside surface (12° to core at 3613') the slickenside lineation is parallel to bedding.
3620.0	3725.0	Wacke, subwacke and argillite with a few beds of quartz wacke and lesser quartz arenite. Bed thickness and proportion of latter two lithotypes increases with depth; medium grey; medium and thin bedded, thick beds are rare above 3698', common below; bed contacts sharp to vague and flat to irregular (flames noted), much of interval is broken; beds are generally graded, some are uniform, above 3698' a few of the thicker beds have a 3-10 cm quartz arenite base. Above 3665' are several calcareous beds (usually thicker beds) and occasional calcareous portions of beds (up to 5 cm), the few cross laminated intervals are calcareous. Subwacke-argillite portions of two thick beds between 3675 - 3680' are convoluted, possibly primary overprinted by tectonic. Single bed of quartz arenite 3717 - 3724'.

811-043

Drill Hole Record

Cominco

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
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Claim | T Brg. | Collar Dip | Elev. | Length | Sheet

Analysis

Footage From	To	Description
3620.0 (Cont'd.)	3725.0	Slickensides noted on several bedding contacts, especially where lithologic contrast is great, and on some fractures at small angle to bedding; one fracture parallels 20 cm of unbroken core has well developed slickenside lineation near-parallel to bedding (3658'). Bedding/cleavage (sense of dip relative to bedding) to core: 81° @ 3663', 86°/04° (opposite) @ 3647', 85°/10° (opposite) @ 3665', 87°/20° (same) @ 3678', 78°/22° (same) @ 3688', 72° @ 3714'.
3725.0	3731.0	About 3' short. Fault zone gouge, light grey fine clay with grit and small rock fragments.
3731.0	3740.0	Quartz arenite and quartz wacke; medium grey; thick bedded; no bed contacts observed. Fractures common, from 0° to 25° to core. At 3732' is a 10 cm gouge zone containing rock fragments to 1 cm across.
3740.0	3751.0	Wacke, subwacke and argillite; medium grey; thin bedded; bed contacts sharp or distinct to flat (most) or wavy. Bedding to core 57° at 3745'.
3751.0	3793.0	Wacke and quartz wacke, minor more argillaceous rock; medium grey; commonly broken but seems mostly medium bedded, probably some thick beds; contacts rare. Rock is crushed in broken zones, rarely see slickensides until last 5 feet. Minor gouge noted, mainly in last 5 feet.
3793.0	3809.0	Quartz arenite, quartz wacke and wacke, medium to light grey; thick bedded; bed contacts broken, vague.
3809.0	3828.0	Wacke, subwacke and argillite; medium grey; medium and thin bedded and a few laminations; to 3815' several beds have been disaggregated and have rip up clasts or a shredded appearance; bed contacts are sharp and flat to wavy. Two graded beds have quartz arenite bases, one is calcareous and the other has calcareous patches. Bedding to core: 47° @ 3810', 43° @ 3822', small fold at 3824' where bedding to core is 0° over 1 cm, 43° @ 3828'.

Drill Hole Record

Cominco

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
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Analysis

Footage From	To	Description
3828.0	3874.0	Quartz arenite, quartz wacke with wacke/subwacke/argillite tops; light grey; fine to very fine grained; thick bedded; bed contacts sharp and flat to wavy; beds are graded, several have rip up clasts or shreds in upper parts, typically Bouma A-D turbidites (none are lisy). Small crush (some gouge) zone at 3835'. Bedding to core: 44° @ 3838', 40° @ 3862'.
3874.0	4080.0	Wacke, subwacke and argillite with less than 10% quartz wacke above 3995' and about 25% quartz wacke and quartz arenite below; medium grey; medium with some thin and some thick beds, especially below 3995'; bed contacts sharp to distinct and generally flat or structurally irregular; most beds are graded but otherwise featureless, a few clasts noted between 3874 and 3886', flame structures and shredded thin beds are present below 4010', one unusual bed from 4061 - 4065' is wacke with a pale brownish colour containing irregular blebs, patches and wisps of light grey quartz wacke (probably an unstable sediment that disaggregated). This entire interval has a variable but often strong tectonic overprint as follows: 3874 - 3891' are many shredded thin bedded intervals and abundant cleavage chlorite. 3891 - 3916 within this interval are several zones of intense strain that are cohesive. Slickensides are <u>not</u> well developed however there are many fractures with fine chlorite coatings. At several points rock appears to be fractured and healed. Most intense strain development is from 3914 - 3916' where texture is schistose (core angle 24° - 42°) and is accompanied by quartz segregation. 3916 - 4013 bedding in this interval is parallel or within 20° of core. 4013 - 4080 bedding to core angel increases, at 4013.5' is 3 cm zone of incohesive gouge and crushed rock fragments. Only other tectonic features might be several of the shredded thin beds, a feature that could also be ascribed to syn-sedimentary tectonic activity. Bedding contrast and minor bleaching are contact metamorphic effects of underlying intrusion.

Drill Hole Record

Cominco Page 20

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
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Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From	To	Description
3874.0 - 4080.0 (Cont'd.)		Bedding/cleavage (sense of cleavage relative to bedding): 13° @ 3875', 25° @3876', 37°/0° (N.A.) @ 3877', 37° @ 3903', 04° @ 3920', 15°/47° (opposite) @ 3922', 65°/40° (opposite) @ 3922.1, 25°/40° (opposite) @ 3922.2' (in these last 3 bedding dips are all in same direction), 20°/0° @ 3927', 02° to 12°/00° to 16° (opposite) @ 3938', 14° @ 3950', 05° @ 3965', (at 3975' is a small fold consistent with overturned bedding), 03° @ 3980', 08° @ 3990', 00°/60° (N.A.) @ 4006', 18° @ 4015', 28° @ 4020', 35° @ 4025', 38° @ 4037', 40° @ 4047', 45° @ 4066', 45° @ 4077'.
4080.0 - 4456.0		Gabbro, at top contact is a zone of about 40 cm than contains an 8 cm biotite segreg--ation or vein, 15 cm of sediment, and 15 cm of irregular patches of chilled gabbro. Then is very uniform gabbro, at first it is fine grained with a biotititic selvage that is likely a conformable contact (41°). Fine grained to 4090' then medium grained to 4110', coarse grained to 4205', medium grained to 4320', fine and medium grained to 4456'. Basal contact is sharp at 37°. Several small quartz veins noted, one at 4115' is yellowish (ankerite + quartz) has a sheared appearance. Largest quartz veins are from 4254 - 4257' (is grey and contains chlorite and ankerite), 4289 - 4293' (is white and contains 30% ankerite) and 4303 - 4304' (grey). Pyrrhotite is present but rare.
4456.0 - 4494.0		Wacke, subwacke and argillite, unusually hard because of contact alteration; medium to dark grey; medium and thin bedded; bed contacts sharp and flat; beds some probably originally quartz wacke, often internally laminated, cross laminations noted in upper 10 feet of interval. Bedding to core 60° @ 4461', 45° @ 4480', 45° @ 4494'.
4494.0 - 4510.5		Quartz wacke and some quartz arenite; medium to light grey; thick bedded; bed contacts distinct to vague, some flat (not all seen as core is moderately broken). At 4507 - 4508' core is fractured (not broken) above a small crush zone (5 mm gouge and sheared fragments) at 60° to core over 5 cm of healed chloritic breccia with slip surfaces.

811-843

Drill Hole Record

Cominco Page 21

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From	To	Description
4510.5 - 4523.5		Wacke, subwacke and argillite; medium grey; medium bedded; bed contacts sharp to vague and flat; below 4515' most beds have faint internal flat parallel laminations. Several bed contacts have chloritic slickenside surfaces. Bedding/cleavage dipping in opposite sense, to core: 59° @ 4511', 52°/22° @ 4516', 60° @ 4520'.
4523.5 - 4546.0		Quartz wacke, some beds possibly quartz arenite, calcareous above 4526' only; light grey; thick bedded with some medium and thin beds to wacke, subwacke and argillite above 4531'; bed contacts usually sharp and flat, some wavy; one bed from 4526-27' is coarse grained, some are medium and most are fine grained; most beds have vague internal features mainly contacts that indicate amalgamation, vague crosscutting bleached fractures are common. Black argillite clast 0.5 X 2cm @ 4535'. Several bed contacts, especially in more argillaceous zones, have well developed slickenside surfaces. Bedding to core 73° @ 4527', 66° @ 4535', 61° @ 4546'.
4546.0 - 4556.5		Wacke, subwacke and argillite; medium to dark grey; medium, thin bedded and laminated; bed contacts sharp to distinct and flat (one wavy); in upper 2 feet beds have several small lithic clasts, several of the beds are graded. Bedding to core 60° @ 4549', 60° @ 4556'.
4556.5 - 4566.5		Quartz wacke and quartz arenite; medium to light grey; fine grained; thick bedded; bed contacts distinct, flat and wavy; beds homogenous with graded tops. Well developed slickensides on several broken fragments at 4564'.
4566.5 - 4572.0		Wacke, subwacke and argillite; medium grey; medium bedded, few thin beds; bed contacts sharp and flat; most beds are graded, three have black argillite clasts to 1 X 2 cm with rare very fine argillite and these are shredded yet overlying bed contact is flat. Bedding to core 60° @ 4568'.
4572.0 - 4580.0		Quartz wacke and quartz arenite, minor wacke; medium grey; thick bedded; fine grained; graded. Fault breccia (healed) with short interval of not badly sheared broken core with chlorite, slickensides and small gouge zone 5 mm wide near top cutting core at 62°.

811-844

Drill Hole Record

Cominco Page 22

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Sheet

Analysis

Footage From	To	Description
4580.0	4586.0	Wacke, subwacke and argillite, minor quartz wacke; thin bedded with 3 medium beds; bed contacts sharp and flat; graded, weak cross-laminations noted at top of one bed, top half of one medium bed contains angular argillite (shredded) clasts in wacke matrix. Bedding/cleavage, dip in opposite sense, to core: 65°/35° @ 4581'.
4586.0	4599.0	Quartz arenite, quartz wacke with tops less than 10 cm grading to argillite; light grey; thick bedded; bed contacts distinct to diffuse and flat to slightly irregular. One 10 cm cream coloured calcareous patch.
4599.0	4607.0	Quartz wacke 60%; medium to light grey; thin (2 medium) bedded and wacke, subwacke and argillite; medium grey; thin bedded; contacts sharp and flat to wavy, flames noted; most beds are graded, one contains a black argillite clast 0.8 X 3 cm. Bedding/cleavage, opposite sense, to bedding: 62°/65° @ 4605'.
4607.0	4618.0	Quartz arenite, graded through quartz wacke to argillite; medium grey; thick to medium bedded; bed contacts sharp and flat to wavy; graded, some subwacke/argillite tops have shredded character.
4618.0	4622.0	Wacke, subwacke and argillite; medium to dark grey; thin bedded to laminated; bed contacts sharp and flat with short intervals shredded. Bedding/cleavage, in opposite sense, to core: 60°/75° @ 4621'.
4622.0	4634.0	Quartz wacke, some quartz arenite, some wacke, all grade to subwacke or argillite; medium grey; thick and medium bedded with several thin beds and laminations; bed contacts sharp and flat to wavy; tops of some beds have shredded appearance; bedding/cleavage, in opposite sense, to core: 63°/60° @ 4628'.
4634.0	4660.5	Wacke, subwacke and argillite with 3 calcareous quartz wacke beds 4652 - 4656'; medium grey, medium and thin bedded, rare laminations; bed contacts sharp and flat to wavy; beds are graded, several have distinct light grey argillite tops.

311-842

Drill Hole Record

Cominco Page 23

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length

Analysis

Footage From	To	Description
4634.0 (Cont'd.)	4660.5	top portions of a few beds have disaggregated, shredded appearance. The calcareous quartz wacke beds are primarily Bouma B laminated, one has Bouma C cross-laminations. Bedding/cleavage, in opposite sense, to core: 67°/40° @ 4640', 73°/38° @ 4650'.
4660.5	4664.5	Porphyritic diabase intrusion, upper contact 55°, lower contact 45° however because of shift in bedding (see below) it could be either a sill or dike. Porphroblasts are often rounded to subangular and constitute only 5% of rock, except in one dense cluster about 10 cm long. Groundmass appears finely chloritic.
4664.5	4684.0	Quartz wacke and wacke, possibly some beds quartz arenite, the basal 1 meter is a calcareous quartz arenite; light grey, thick bedded; bed contacts are sharp to distinct and flat; one two foot thick bed is a lithic wacke containing abundant small 1 - 3 mm elongate clasts and one large clast. Portions of the wacke, subwacke are laminited. One quartz wacke is a Bouma B turbidite. Bedding/cleavage, in opposite sense, to core: 22°/23° @ 4667', 59°/71° @ 4675', 70° @ 4678'.
4684.0	4686.5	Wacke, subwacke and argillite; medium grey; thin bedded and laminated; bed contacts sharp and flat; one zone of argillite rip-up clasts.
4686.5	4706.0	Quartz wacke; light grey; fine and medium grained; thick and very thick bedded; bed contacts distinct to vague and flat, probable amalgamation of some beds. About 2 cm of gouge and platy argillite at 4695'. At 4699' in argillaceous contact are numerous calcareous prismatic laths.
4706.0	4725.0	Wacke, subwacke and argillite; medium grey; thin bedded to laminated with a few medium beds; bed contacts are sharp to distinct and flat to wavy, some shredded and disaggregated during tectonism. Calcareous masses as rectangular laths to equant or subrounded shapes are common below 4716'. Bedding/cleavage, in opposite sense to bedding, to core: 65°/80° @ 4711', 65° @ 4724'.

311-8

Drill Hole Record

Cominco Page 24

Property Sullivan | District Western | Hole No. DDH6464

Commenced | Location | Tests at | Hor. Comp.

Completed | Core Size | Corr. Dip | Vert. Comp.

Co-ordinates | True Brg. | Logged by

Objective | % Recov. | Date

Claim | T Brg. | Collar Dip | Elev. | Length | Hole No. | Sheet

Analysis

Footage From	To	Description
4725.0	4740.0	Quartz arenite and quartz wacke' portions of which have very fine calcite grains weakly disseminated; light grey; thick to very thick bedded; bed contacts vague (some amalgamated). From 4736 to 4738.5' core is fractured, some broken with at least 4 cm of incoheisve gouge (mostly rock chips and very little clay); and a 2 cm wide breccia with 40% chlorite matrix is present across half of the core, terminating against a vertical fracture. A small amount of gouge is also present at 4736'. There is no core loss at runs ending at 4738.5' or 4749.0'.
4740.0	4749.0	Wacke, subwacke and argillite; medium grey; thin bedded and laminated with 2 medium beds at base; bed contacts sharp and flat; bedding/cleavage (?), in opposite sense to bedding, to core 64°/45° @ 4743'. Small crush zone and gouge at 4743'; slickensides developed on many bedding surfaces.
4749.0	4757.0	Quartz arenite with relatively thin tops graded to argillite; several very thin beds in intervals up to 15 cm thick; fine grained; medium grey; thick and medium bedded; bed contacts sharp and flat to wavy; some cross laminations in the wavy thin beds; black rip-up clast 0.5 X 4 cm at bed top.
4757.0	4792.0	Wacke, with lesser subwacke, argillite and quartzitic wacke; medium grey; medium bedded with several thin beds and a few thick beds; bed contacts are sharp and flat, rarely slightly wavy; a few beds a internally laminated, and near top of interval some have cross laminations, one dark 0.5 X 3 cm clasts noted at 4790'; numerous bed contacts have slickensided surfaces. Bedding/cleavage, in opposite sense to bedding, to core: 72°/45° @ 4769', 55°/14° @ 4791'. There appears to be a second cleavage developed in the more argillaceous beds below 4777'.
4792.0	4847.0	Quartz wacke, a few beds in upper part of interval possibly are quartz arenite, in about 40% of interval bed bases are wacke, all beds grade to subwacke or argillite, thin bedded to laminated argillaceous intervals 4812.5 - 4814.0' and 4827.0 - 4830.0'; medium grey; thick and medium bedded; bed contacts sharp, a few gradational, and flat (most), one flame noted, some are irregular and shredded 4812 - 4815'; two dark grey rip-up clasts noted. Slickensides present on some bed surfaces.

Drill Hole Record

Cominco Page 25

Property Sullivan | District Western | Hole No. DDH6464

Commenced | Location | Tests at | Hor. Comp.

Completed | Core Size | Corr. Dip | Vert. Comp.

Co-ordinates | True Brg. | Logged by

Objective | % Recov. | Date

Claim | T Brg. | Collar Dip | Elev. | Length | Hole No. | Sheet

Analysis

Footage From	To	Description
4792.0 (Cont'd.)	4847.0	Core broken 4837 - 4839'. A small amount of gouge, crush rock with a calcite vein with slickensides on a bed contact at 4839.5'. Bedding/cleavage, in opposite sense to bedding, to core: 75°/57° @ 4804'; 60°/90°, with S_2 kink 6° in same sense as bedding, @ 4828', 50° @ 4844'.
4847.0	4867.0	Wacke, subwacke and argillite; dark grey; medium and thin bedded and laminated, two thick quartz wacke beds 4863 - 4867'; bed contacts sharp to gradational and flat; laminations noted are often quite faint and they are present throughtout intervals of 10 to 20 cm. Calcareous laths noted in some fo the laminites. Bedding/cleavage, in opposite sense to bedding, to core: 46°/30° @ 4955'. Pyrrhotite grains define the cleavage.
4867.0	4875.0	Wacke, subwacke and argillite; dark grey; thin bedded with laminite in intervals up to 30 cm thick; laminations are faint but easily recognized throughout; bed contacts are sharp and flat. Bedding/cleavage (pyrrhotite), in opposite sense to bedding, to core: 55°/55o @ 4875'.
4875.0	4882.5	Quartz arenite to quartz wacke; medium grey; two medium beds over single very thick bed; contacts sharp and flat.
4882.5	4885.0	Argillite and subwacke; medium grey; laminated; all laminations are graded. At 4884.5', bedding is 60°; pyrrhotite cleavage is 83° in opposite sense to bedding in light grey subwacke and bundled sericitic cleavage present only in some argillites is 17° in same sense as bedding.
4885.0	4903.0	Quartz wacke and wacke with relatively thin tops graded to subwacke or argillite; medium grey; thick (most of interval) and medium bedded; bed contacts sharp (most) to gradational, possibly amalgamated, most are flat.

Drill Hole Record

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From	To	Description
4903.0	4906.0	Wacke, subwacke and argillite; medium and dark grey; laminated and thin bedded; bed contacts are sharp and flat; laminated intervals are up to 10 cm thick. Bedding to core 60°. Small shear up to 8 mm wide appears to have an s-c fabric and a calcite seam (1mm) on hangingwall.
4906.0	4931.0	Quartz wacke, one bed of quartz arenite, graded through wacke, subwacke and argillite; medium and fine grained; medium to light grey; thick bedded; contacts sharp to vague and flat to irregular; some bed bases are reverse graded over a few cm. The quartz arenite thick bed is very weakly calcareous.
4931.0	4943.0	Wacke, subwacke and argillite, minor quartz wacke; medium grey; thin bedded and laminated with medium and thick beds over 50% of interval; bed contacts sharp and flat to, rarely, wavy, shredded over 15 cm at 4942'. Most beds are graded; some have fine nearly disaggregated clasts in the upper portion of the bed, one dark grey argillite clast noted. Bedding to core 60° @ 4933'.
4943.0	4968.0	Quartz wacke and wacke with minor subwacke argillite in tops, some beds have quartz arenite bases; fine grained; medium to light grey; thick bedded with a few medium and thick beds; bed contacts sharp to gradational and flat to wavy, flames noted; graded, some internal contacts in tops are shredded to convoluted. Slickensides present on some bedding surfaces. Bedding/cleavage (opposite) to core: 50°/06° @ 4959'.
4968.0	4978.0	Wacke, subwacke and argillite, medium, thin bedded, and laminated; with 50% of interval of wacke and quartzitic wacke in medium, and one thick, beds; medium grey; bed contacts are sharp and flat to wavy, flame structures noted. From 4975.5 to 4978.0' interval is wavy laminated throughout. Bedding to core 60° @ 4971'.
4978.0	5007.0	Wacke, minor quartz wacke, subwacke and argillite; medium grey; medium to thick bedded with few thin beds; bed contacts sharp and flat with some flame structures. Bedding/cleavage (opposite) to core: 58° @ 4988', 44°/10° @ 5000', 25°/55° @ 5007'.

Drill Hole Record

Property Sullivan	District Western	Hole No. DDH6464	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From	To	Description
5007.0	5053.0	Quartz wacke, quartz arenite, with a fair amount of wacke and minor subwacke and argillite; thick bedded; bed contacts sharp and flat, some slightly wavy. Predominantly argillite 5020 - 5023.5' has a 10 cm fault of gouge and rock chips, upper contact of fault cuts core at 40°. Bedding to core: curves from 35° to 15° @ 5020', cleavage is opposite at 63°, 45° @ 5033'.
5053.0	5065.0	Wacke, subwacke and argillite; medium grey; thin bedded, rarely laminated; bed contacts sharp and wavy (folding?); beds are graded. Core is broken from 5060 - 5065'. Slickensides noted on some bedding planes, but not common. Bedding/cleavage (opposite?) 42°/02° @ 5057'.
5065.0	5290.0	Lithotypes and cyclic type of sedimentation typical of last several hundred continues to 5290'.
5290.0	5652.0	Predominantly subwacke and argillite, some wacke and minor quartz wacke. Bedding is near parallel and parallel to core throughout this interval.
5652.0	5701.0	Wacke, subwacke and argillite; medium grey; medium to thin bedded; bed contacts sharp and flat. Bedding to core 75°.

APPENDIX B

SULLIVAN MINE GROUP OF MINERAL CLAIMS

NOVEMBER 27, 1986

		Number of Units	
1.	Crown-Granted M.C.		680
2.	Held by Assessment:		
	2(a) TWO POST CLAIMS		
	Luke Group	75	
	Rho Group	20	
	Med Group	15	
	Donna, Etc. Group	15	
	Uke Group	11	
	Mar Group	17	
	Bad Group	36	
	Late Group	91	
	Mat Group	268	
	Jackpot	1	549
	2(b) REVERTED CROWN GRANTED MINERAL CLAIMS		
	Tip 4-12	9	
	Hope 2-12	11	
	Sun 2-12	11	
	Cue 2-12	11	
	B.C., Silver Bell, Tarrant	3	
	Black Hills, Yankee Girl, Wasp Fr.	3	
	Blue Dragon	1	49
	2(c) MINERAL CLAIMS (54)		
	Dip 1-8	56	
	Fal 1-14	84	
	Golf 1-3	17	
	Quark 1&2	12	
	Fin 1-3	18	
	Mead 1-3	36	
	Gin 1-9	110	
	Clair 24-32	56	
	Mark 1-3	17	406
3.	Greenhorn Mineral Lease		1
	GRAND TOTAL (1 + 2 + 3)		1,685

PWR/lrm

APPENDIX C

STATEMENT OF EXPENDITURES

DDH 6464

DIRECT COSTS

Contractor: Connors Drilling Ltd.
2007 West Trans Canada Highway
Kamloops, B.C. V1S 1A7

Drilling 0' - 5701', all invoices	$258,413.28
Direct costs =	$258,413.28

INDIRECT COSTS

Salaries:		
P.W. Ransom -	Geologist - supervision, core logging, report writing 88 days @ $250/day	$ 22,000.00
Supplies:	Mud - gel	6,477.00
	- polymers etc.	43,795.94
	Core boxes	2,734.71
Transportation:		
	Geologist 4X4 truck - 88 days @ $40/day	3,250.00
	Transportation of mud etc.	1,929.48
Cominco Charges:		
	Road and site construction	7,625.00
	Snow clearing	2,460.00
	Inter-office freight charges re supplies	492.48
	Core racks - Labour	2,185.70
	- Materials (est.) + installation	2,000.00
	Install radios at drill	360.00
	Carpentry work	620.00
	Federal and Provincial sales taxes re Cominco work	501.74
Other Contractors:		
	Crestbrook Forest Industries, Cranbrook, B.C. - bridge and culvert installation	4,374.22
	Indirect costs =	$100,806.27
	Total Direct + Indirect costs =	$359,219.55

Signed: P.W. Ransom

P.W. RANSOM
Project Geologist

APPENDIX D

IN THE MATTER OF THE

B.C. MINERAL ACT

AND

IN THE MATTER OF A DIAMOND DRILL PROGRAMME

CARRIED OUT ON THE TELFER AND BURGESS CLAIM GROUPS

MARK CREEK AREA

in the Fort Steele Mining Division of
the Province of British Columbia

More Particularily N.T.S. 82F/9

A F F I D A V I T

I, P.W. Ransom, of the rural district of Wycliffe, in the Province of British Columbia, make Oath and say:

1. That I am employed as a Geologist by Cominco Ltd. and as such, have a personal knowledge of the facts to which I hereinafter depose:

2. That annexed hereto and marked as Appendix C to this my Affidavit is a true copy of expenditures incurred on a Diamond Drill programme, on the Telfer and Burgess mineral claim groups.

3. That the said expenditures were incurred between the 1st day of October, 1987 and the 15th day of February, 1988 for the purpose of mineral exploration on the above noted claim group.

P.W. RANSOM
PROJECT GEOLOGIST

APPENDIX E

STATEMENT OF QUALIFICATIONS

As author of this report, I, Paul W. Ransom, certify that:

I am a geologist active in minerals exploration.

I am a graduate of McGill University with a degree of Bachelor of Science.

I have been continuously engaged in mining and exploration since 1966.

I am a member of the Geological Association of Canada.

I supervised Cominco Ltd.'s Sullivan Mine area exploration drilling program in 1987 and 1988.

P.W. RANSOM, G.A.C.